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REMARKS

Favorable reconsideration, reexamination, and allowance of the present patent application are respectfully requested in view of the foregoing amendments and the following remarks. The amendments to the claims are fully supported by the original specification and do not add new matter. Specifically, the claim amendments are supported in the specification at at least paragraph [0032], and in the original claims.

Objections to the Claims

In paragraph 1 of the Office Action, the Examiner objected to claim 8. The grammar in this claim has been corrected. Therefore, Applicants respectfully request reconsideration of this objection.

Rejection under 35 U.S.C. § 101

In the Office Action, beginning at page 2, Claims 1-5 were rejected under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter. Applicant respectfully requests reconsideration of this rejection.

The claims have been amended to indicate that the protein/DNA species are "isolated". For at least the foregoing reason, Applicant respectfully submits that Claims 1-5 are directed to statutory subject matter, and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 101.

Rejection under 35 U.S.C. § 112, second paragraph

In the Office Action, beginning at page 2, Claim 6 was rejected under 35 U.S.C. § 112, second paragraph, as reciting subject matters that allegedly are indefinite. Applicant respectfully requests reconsideration of this rejection.

Claim 6 has been amended to recite that the DNA is "isolated" from the bacterium. For at least the foregoing reasons, Applicant respectfully submits that Claim 6 fully complies with 35 U.S.C. § 112, second paragraph, and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 112.

In the Office Action, beginning at page 3, Claim 5 was rejected under 35 U.S.C. §

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112, second paragraph, as reciting subject matters that allegedly are indefinite. Applicant respectfully requests reconsideration of this rejection.

The claims have been amended to recite the specific conditions which are used for hybridization. For at least the foregoing reasons, Applicant respectfully submits that Claim 5 fully complies with 35 U.S.C. § 112, second paragraph, and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 112.

In the Office Action, beginning at page 3, Claims 6 and 8 were rejected under 35 U.S.C. § 112, second paragraph, as reciting subject matters that allegedly are indefinite. Applicant respectfully requests reconsideration of this rejection.

The claims have been amended as suggested by the Examiner. For at least the foregoing reasons, Applicant respectfully submits that Claims 6 and 8 fully comply with 35 U.S.C. § 112, second paragraph, and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 112.

Rejection under 35 U.S.C. § 112, first paragraph

In the Office Action, beginning at page 3, Claims 1-9 were rejected under 35 U.S.C. § 112, first paragraph, as reciting subject matters that allegedly are not enabled by the specification.

The claims have been amended to recite that the protein can vary in amino acid residues by either 1-20 amino acids (claims 1 and 3) or by 1-10 amino acids (claims 2 and 4) as compared to the sequence depicted in SEQ ID NO: 4. Such variation in the sequence is minimal (3% for claims 1 and 3 and 1% for claim 2 and 4) and clearly renders it within the skill of one in the art to determine sequences which fall within this small variation and have lysine decarboxylase activity. In fact, given the information in the art about lysine decarboxylase derived from other species, one of skill in the art could clearly surmise regions of the protein which might be amenable to the slight variation allowed by the claim language (3% and 1%) while retaining the lysine decarboxylase activity. It would not require undue experimentation for the skilled art worker to determine protein variants of SEQ ID NO: 4, or proteins encoded by variants of the DNA of SEQ ID NO: 3 within the claimed ranges since a 3% difference, or for this protein 20

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amino acids, is minimal and clearly within routine experimentation. Furthermore, the literature is replete with other examples of lysine decarboxylase proteins from other bacterial species which can serve to guide the skilled art worker as to residues which might be conserved and hence not amenable to change, or not conserved, and hence possibly amendable to change (see the specification, "Background of the Invention" section). Therefore, such experimentation would not be conducted without ample guidance based on the knowledge in the art, which must be considered when assessing enablement. Applicants respectfully point out that enablement "is not precluded even if some experimentation is necessary, although the amount of experimentation needed must not be unduly extensive." *Hybritech Inc. v. Monoclonal Antibodies, Inc.* 802 F.2d 1367 (Fed. Cir. 1987), *cert. denied*, 480 U.S. 947 (1987). Therefore, the experimentation necessary for identifying lysine decarboxylase proteins and DNA species which fall within the scope of the claims is not undue. Applicants also assert that sufficient guidance has been provided in the specification, particularly when combined with the general state of the art, so that one skilled in the art would be able to choose and determine through routine experimentation which DNA and protein species would possess the claimed activity. Furthermore, inoperable embodiments are permitted, as long as one skilled in the art is not required to experiment unduly to practice the claimed invention. *Atlas Powder co. v. El du Pont de Nemours & Co.*, 750 F.2d 1569 (Fed. Cir. 1984).

For at least the foregoing reasons, Applicants respectfully submit that Claims 1-6 and 8-9 fully comply with 35 U.S.C. § 112, first paragraph (enablement), and therefore respectfully request withdrawal of the rejection thereof under 35 U.S.C. § 112.

In the Office Action, beginning at page 7, Claims 1-9 were rejected under 35 U.S.C. § 112, first paragraph, as reciting subject matters that allegedly contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant respectfully requests reconsideration of this rejection.

As previously stated, the claims have been amended to recite that the protein can

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vary in amino acid residues by either 1-20 amino acids (claims 1 and 3) or by 1-10 amino acids (claims 2 and 4) as compared to the sequence depicted in SEQ ID NO: 4. Such variation in the sequence is minimal and clearly renders it within the skill of one in the art to determine sequences which fall within this variation and have lysine decarboxylase activity. In fact, given the information in the art about lysine decarboxylase derived from other species, one of skill in the art could clearly surmise regions of the protein which might be amenable to the slight variation allowed by the claim language (3% and 1%) while retaining the lysine decarboxylase activity. Therefore, given the information available from Applicant's specification combined with the knowledge in the art, clearly applicants were in possession of the claimed invention.

For at least the foregoing reasons, Applicant respectfully submits that Claims 1-6, and 8-9 fully comply with 35 U.S.C. § 112, first paragraph, and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 112.

Rejection under 35 U.S.C. § 102

In the Office Action, beginning at page 8, Claim 1 was rejected under 35 U.S.C. § 102, as reciting subject matters that allegedly are anticipated by Sabo et al. Applicant respectfully requests reconsideration of this rejection.

The claim has been amended to recite that the protein can vary in amino acid residues by either 1-20 amino acids as compared to SEQ ID NO: 4, which amounts to a 3% variance of the sequence, or at least 97% homologous. As the cited prior art discloses a protein which is only 34.9% homologous to SEQ ID NO: 4, the claims as amended clearly are not anticipated by the prior art.

For at least the foregoing reasons, Applicant respectfully submits that the subject matter of Claim 1 is not anticipated by Sabo et al., is therefore not unpatentable under 35 U.S.C. § 102, and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 102.

In the Office Action, beginning at page 8, Claims 3, 5 and 6 were rejected under 35 U.S.C. § 102, as reciting subject matters that allegedly are anticipated by Kukuchi et al.. Applicants respectfully request reconsideration of this rejection. The claims have

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been amended to recite that the DNA encodes a protein which can vary by 1-20 amino acids, or 3%. Therefore, the variant sequence must be at least 97% homologous to SEQ ID NO: 4. As the cited prior art discloses a gene which is only 51.1% homologous to SEQ ID NO: 3, the claims as amended clearly are not anticipated by the prior art.

For at least the foregoing reasons, Applicant respectfully submits that the subject matters of Claims 3, 5 and 6 are not anticipated by Kukuchi et al., are therefore not unpatentable under 35 U.S.C. § 102, and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 102.

Rejection under 35 U.S.C. § 103(a)

In the Office Action, beginning at page 9, Claims 7-9 were rejected under 35 U.S.C. § 103(a), as reciting subject matters that allegedly are obvious, and therefore allegedly unpatentable, over the disclosure of U.S. Patent No. 5,827,698 (Kikuchi et al.), WO2000/61723 (Gunji et al.), and US2003/0124687 (Gunji et al.). Applicant respectfully requests reconsideration of this rejection.

It is first unclear which Gunji reference the Examiner is relying upon, since the cited published US patent application is NOT the equivalent or a translation of the cited Japanese WO patent, as the Examiner seems to indicate in the cover sheet of the Office Action sent on September 14, 2005. The US published patent application claims priority to Japanese patent application JP2001-177075, which is not claimed as a parent to the WO patent. Therefore, the US published patent application is not an equivalent to the WO patent.

Therefore, since the Examiner appears to be applying Gunji et al. as a secondary reference to Kukuchi et al., this rejection will be addressed as if the Examiner is citing both the Gunji et al. PCT patent application (WO2000/61723) and the US published patent application (US2003/0124687) as secondary references to the primary Kukuchi et al. reference. If this interpretation of the Office Action is incorrect, clarification of the Office Action is respectfully requested.

The inventors of the claimed invention and the inventors of the invention disclosed in the US published patent application (US2003/0124687) were both under an obligation to assign the inventions to Ajinomoto Inc. at the time of the claimed invention,

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or February 23, 2003 (then filing date of the claimed invention in Japan). Therefore, under 35 U.S.C. §103(c), this reference may not be relied upon under 103(a). Applicants respectfully request an indication of such by the Examiner, and withdrawal of any rejections over this reference.

Despite the ineligibility of this US published application (US2003/0124687) to be available as prior art, the disclosure fails to cure the deficiency of Kikuchi et al.. This reference only describes the use of *Methylophilus* bacteria for producing L-amino acids, and discloses nothing of disrupting any gene for the purpose of suppressing lysine decarboxylase activity, nor mentions the lysine decarboxylase gene of any sequence. One of skill in the art would not be motivated to combine the teachings of this reference since there is no indication that the gene of Kikuchi et al., which is very dissimilar as compared to the claimed gene, would function in the *Methylophilus* as does the inventive gene sequence of SEQ ID NO: 3.

As for the rejection over Kikuchi et al. combined with WO 2003/61723, it is unclear how the Examiner has reviewed and characterized the WO2003/61723 reference, unless the Examiner can read Japanese, in light of the brief English abstract. However, since the instant application is assigned to the same entity, applicants can explain why the reference fails to render obvious the claimed invention on its own, or when combined with Kikuchi et al. Claim 7 has been cancelled and claims 8 and 9 have been amended to better clarify the invention.

As stated above, Kikuchi et al. describes a lysine decarboxylase gene which is only 51% homologous with the nucleotide sequence of SEQ ID NO:3. The sequences are very dissimilar and hence one of ordinary skill in the art would not be expected to arrive at the inventive DNA sequence, the *Methylophilus* bacterium, and/or the disrupted gene resulting in suppression of lysine decarboxylase activity, without undue experimentation.

Similar to the disclosure of US2003/0124687, the disclosure of the WO00/61723 reference also fails to make up for the deficiency of Kikuchi et al. with respect to the subject matters of the pending claims, since WO00/61723 only describes the use of *Methylophilus* bacteria for producing L-amino acids, and discloses nothing of disrupting any gene for the purpose of suppressing lysine decarboxylase activity, nor mentions the lysine decarboxylase gene of any sequence. One of skill in the art would not be

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motivated to combine the teachings of these references since there is no indication that the gene of Kikuchi et al., which is very dissimilar as compared to the claimed gene, would function in the *Methylophilus* as does the inventive gene sequence of SEQ ID NO: 3.

For at least the foregoing reasons, Applicant respectfully submits that the subject matters of Claims 7-9, each taken as a whole, would not have been obvious to one of ordinary skill in the art at the time of Applicant's invention, are therefore not unpatentable under 35 U.S.C. § 103(a), and therefore respectfully requests withdrawal of the rejection thereof under 35 U.S.C. § 103(a).

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Conclusion

For at least the foregoing reasons, Applicant respectfully submits that the present patent application is in condition for allowance. An early indication of the allowability of the present patent application is therefore respectfully solicited.

If Examiner Gebreyesus believes that a telephone conference with the undersigned would expedite passage of the present patent application to issue, he is invited to call on the number below.

It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and the undersigned authorizes the charging of any of the required fees to our deposit account 50-2821.

Respectfully submitted,

By: 

Shelly Guest Cermak
Registration No. 39,571

U.S. P.T.O. Customer No. 38108
Cermak & Kenealy, LLP
515 E. Braddock Road, Suite B
Alexandria, VA 22314
703.778.6608

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